KSA LIBRARY, B'lore
B019038
346.046 916 2 RP 1924
HH14

F I N A L A G R E E M E N T

BETWEEN THE MYSORE AND THE MADRAS GOVERNMENTS

IN REGARD TO THE

CONSTRUCTION OF A DAM AND A RESERVOIR AT

KRISHNARAJASAGARA

18th February 1924.

1924

(B) 19038

38

5

Karnataka State Archives,
Departmental Library)
ಕರ್ನಾಟಕ ರಾಜ್ಯ ಪತ್ರಾಗಾರ
(ಇಲಾಖಾ...
ಗ್ರಂಥಾಲಯ)
Accession No. (B) 19038
Date .

FINAL AGREEMENT

BETWEEN THE MYSORE AND THE MADRAS GOVERNMENTS

IN REGARD TO THE

CONSTRUCTION OF A DAM AND A RESERVOIR AT KRISHNARAJASAGARA

18th February 1924.

KARNATAKA STATE ARCHIVES LIBRARY
BANGALORE
Class
Acc No.
Bill Dt.

(B) 19038.

Karnataka State Archives,
(Departmental Library)
Accession No. (B) 19038
Date.

AGREEMENT.

1. WHEREAS by an agreement, dated 18th February 1892, commonly known and cited as the 1892 agreement, entered into between the Government of His Highness the Maharaja of Mysore, hereinafter referred to as the Mysore Government and the Government of Madras, hereinafter referred to as the Madras Government, certain rules and schedules defining the limits within which no new irrigation works are to be constructed by the Mysore Government without previous reference to the Madras Government were framed and agreed to ; and

2. WHEREAS under clause III of the said agreement the Mysore Government asked for the consent of the Madras Government to the construction of a dam and a reservoir across and on the river Cauvery at Kannambadi now known as the Krishnarajasagara dam and reservoir ; and

3. WHEREAS a dispute arose as to the terms under which the Mysore Government were to construct the dam in the manner and form proposed by them ; and

4. WHEREAS such dispute was referred to the arbitration of Sir H. D. Griffin who gave an award in the year 1914 as to the terms and conditions under which the Madras Government should consent to the construction of the said dam and reservoir ; and

5. WHEREAS the Madras Government, after the said award of the said arbitrator was ratified by the Government of India, appealed to the Secretary of State for India who re-opened the question ; and

6. WHEREAS thereupon the Mysore Government and the Madras Government with a view to an amicable settlement of the dispute entered into negotiations with each other ; and

7. WHEREAS as the result of such negotiations, certain Rules of Regulation of the Krishnarajasagara Reservoir were framed and agreed to by the Chief Engineers of the Mysore and Madras Governments on the 26th day of July of the year 1921, such Rules of Regulation forming Annexure I to this agreement ; and

8. WHEREAS thereafter the technical officers of the two Governments have met in conference and examined the question of extension of irrigation in their respective territories with a view to reaching an amicable arrangement ; and

9. WHEREAS as the result of such examination and conference by the technical officers of the two Governments, certain points with respect to such extension were agreed to respectively by the Chief Engineer for Irrigation, Madras, and the Special Officer, Krishnarajasagara Works, at Bangalore, on the 14th day of September 1923, such points forming Annexure III to this agreement.

10. Now these presents witness that the Mysore Government and the Madras Government do hereby agree and bind themselves, their successors and representatives as follows :—

(i) The Mysore Government shall be entitled to construct and the Madras Government do hereby assent under clause III of the 1892 agreement to the Mysore Government constructing a dam and a reservoir across and on the river Cauvery at Kannambadi, now known as the Krishnarajasagara, such dam and reservoir to be of a storage capacity of not higher than 112 feet above the sill of the under-sluices now in existence corresponding to 124 feet above bed of the river before construction of the dam, and to be of the effective capacity of 44,827 m. c. ft., measured from the sill of the irrigation sluices constructed at 60 feet level

above the bed of the river up to the maximum height of 124 feet above the bed of the river; the level of the bed of the river before the construction of the reservoir being taken as 12 feet below the sill level of the existing under-sluices; and such dam and reservoir to be in all respects as described in schedule forming Annexure II to this agreement.

(ii) The Mysore Government on their part hereby agree to regulate the discharge through and from the said reservoir strictly in accordance with the Rules of Regulation set forth in the Annexure I, which Rules of Regulation shall be and form part of this agreement.

(iii) The Mysore Government hereby agree to furnish to the Madras Government within two years from the date of the present agreement dimensioned plans of anicuts and sluices or open heads at the off-takes of all existing irrigation channels having their source in the rivers Cauvery, Lakshmanathirtha and Hemavathi, showing thereon in a distinctive colour all alterations that have been made subsequent to the year 1910, and further to furnish maps similarly showing the location of the areas irrigated by the said channels prior to or in the year 1910.

(iv) The Mysore Government on their part shall be at liberty to carry out future extensions of irrigation in Mysore under the Cauvery and its tributaries to an extent now fixed at 110,000 acres. This extent of new irrigation of 110,000 acres shall be in addition to and irrespective of the extent of irrigation permissible under the Rules of Regulation forming Annexure I to this agreement, *viz.*, 125,000 acres *plus* the extension permissible under each of the existing channels to the extent of one-third of the area actually irrigated under such channel in or prior to 1910.

(v) The Madras Government on their part agree to limit the new area of irrigation under their Cauvery-Metur Project to 301,000 acres, and the capacity of the new reservoir at Metur, above the lowest irrigation sluice to ninety-three thousand five hundred million cubic feet.

Provided that, should scouring sluices be constructed in the Dam at a lower level than the irrigation sluice, the dates on which such scouring sluices are opened shall be communicated to the Mysore Government.

(vi) The Mysore Government and the Madras Government agree with reference to the provisions of clauses (iv) and (v) preceding, that each Government shall arrange to supply the other as soon after the close of each official or calendar year, as may be convenient, with returns of the areas newly brought under irrigation, and with the average monthly discharges at the main canal heads, as soon after the close of each month as may be convenient.

(vii) The Mysore Government on their part agree that extensions of irrigation in Mysore as specified in clause (iv) above shall be carried out only by means of reservoirs constructed on the Cauvery and its tributaries mentioned in Schedule A of the 1892 agreement. Such reservoirs may be of an effective capacity of 45,000 m. c.ft., in the aggregate and the impounding therein shall be so regulated as not to make any material diminution in supplies connoted by the gauges accepted in the Rules of Regulation for the Krishnarajasagara forming Annexure I to this agreement, it being understood that the rules for working such reservoirs shall be so framed as to reduce to within 5 per cent any loss during any impounding period, by the adoption of suitable proportion factors, impounding formula or such other means as may be settled at the time.

(viii) The Mysore Government further agree that full particulars and details of such reservoir schemes and of the impounding therein, shall be furnished to the Madras Government to enable them to satisfy themselves that the conditions in clause (vii) above will be fulfilled. Should there arise any difference of opinion between the Madras and Mysore Governments as to whether the said conditions are fulfilled in regard to any such scheme or schemes, both the Madras and Mysore Governments agree that such difference shall be settled in the manner provided in clause (xv) below.

(ix) The Mysore Government and the Madras Government agree that the reserve storage for power generation purposes now provided in the Krishnarajasagara may be utilized by the Mysore Government according to their convenience from any other reservoir hereafter to be constructed, and the storage thus released from the Krishnarajasagara may be utilised for new irrigation within the extent of 110,000 acres provided for in clause (iv) above.

(x) Should the Mysore Government so decide to release the reserve storage for power generation purposes from the Krishnarajasagara, the working tables for the new reservoir from which the power water will then be utilized shall be framed after taking into consideration the conditions specified in clause (vii) above and the altered conditions of irrigation under the Krishnarajasagara.

(xi) The Mysore Government and the Madras Government further agree that the limitations and arrangements embodied in clauses (iv) to (viii) supra shall, at the expiry of fifty years from the date of the execution of these presents, be open to reconsideration in the light of the experience gained and of an examination of the possibilities of the further extension of irrigation within the territories of the respective Governments and to such modifications and additions as may be mutually agreed upon as the result of such reconsideration.

(xii) The Madras Government and the Mysore Government further agree that the limits of extension of irrigation specified in clauses (iv) and (v) above shall not preclude extensions of irrigation effected solely by improvement of duty, without any increase of the quantity of water used.

(xiii) Nothing herein agreed to or contained shall be deemed to qualify or limit in any manner the operation of the 1892 agreement in regard to matters other than those to which this agreement relates or to affect the rights of the Mysore Government to construct new irrigation works on the tributaries of the Cauvery in Mysore not included in Schedule A of the 1892 agreement.

(xiv) The Madras Government shall be at liberty to construct new irrigation works on the tributaries of the Cauvery in Madras and, should the Madras Government construct, on the Bhavani, Amaravati or Noyil rivers in Madras, any new storage reservoir, the Mysore Government shall be at liberty to construct, as an off-set, a storage reservoir, in addition to those referred to in clause (vii) of this agreement on one of the tributaries of the Cauvery in Mysore, of a capacity not exceeding 60 per cent of the new reservoir in Madras.

Provided that the impounding in such reservoirs shall not diminish or affect in any way the supplies to which the Madras Government and the Mysore Government respectively are entitled under this agreement, or the division of surplus water which, it is anticipated, will be available for division on the termination of this agreement as provided in clause (xi).

(xv) The Madras Government and the Mysore Government hereby agree that, if at any time there should arise any dispute between the Madras Government and the Mysore Government touching the interpretation or operation or carrying out of this agreement, such dispute shall be referred for settlement to arbitration, or if the parties so agree shall be submitted to the Government of India.

P. HAWKINS,

Secretary to Government,
Public Works Department,
Madras.

18th February 1924.

A. R. BANERJI,

Dewan of Mysore.

18th February 1924.

ANNEXURE I.

RULES OF REGULATION OF THE KRISHNARAJASAGARA RESERVOIR UNDER CONSTRUCTION ON THE CAUVERY IN THE MYSORE TERRITORY.

PREAMBLE.

The following rules of regulation of the Krishnarajasagara (formerly known and referred to, in the rules of regulation previously in force, as the Kannambadi reservoir) shall supersede *in toto* those forming part of the award, dated 21st April 1914, on term of reference 3(*a*) given by the Arbitrator appointed by the Government of India to arbitrate between the Madras and the Mysore Governments on the question of the storage of the waters of the river Cauvery within Mysore territory.

The rules, with the exception of Nos. 1 to 9 inclusive, 10 (except in so far as it relates to Kn.), 11, 12, 14 (ii), 15 to 17 inclusive, 22, 23, 26 (i), (iii) and (v), 27 to 30 inclusive and 32, shall be subject to amendment as may be desirable, subject to the conditions below:—

(*a*) The rules may be altered tentatively for one or two years, by agreement of both parties.

(*b*) At the end of the tentative period the amended rules may be confirmed by the consent of both parties.

(*c*) Subject to conditions (*a*) and (*b*) above, amendment of any rule shall not be a bar to further amendment or reversion to the original rules by consent of both parties.

I. RULES OF REGULATION, GENERAL.

1. The carrying out of these rules of regulation shall, in so far as they relate to the regulation of the Krishnarajasagara, be the duty of a Controlling officer appointed by the Government of Mysore, and of a subordinate staff working under his orders.

2. The only discretion to be exercised by the Controlling officer in operating the rules of regulation shall be as to the means by which the water to be passed from the reservoir to the river shall be passed and such discretion shall be exercised in general accordance with the instructions of the Mysore Government.

3. The curves of discharge of all gauging places in the Mysore State shall be verified by gauging at intervals of three years. Cross-sections of the rivers at the gauging sites shall be taken twice a year, in the first fortnight in June and in the first fortnight of October. If a cross-section taken in June, at any gauging site, indicates a marked change in cross-sectional area, gauge for gauge, joint gaugings shall be made at once, on the request of either party, to verify the discharge curve for the station. Any modification in the curve, found necessary, shall not, however, be applied to regulation for the year in which the gaugings are made.

4. The verification of curves of discharge, referred to in rule 3 above, shall be made jointly by Mysore and Madras; and if such verification shows that modification is necessary such modification shall be made by mutual agreement.

5. All formulæ and co-efficients in such formulæ of discharge, referred to in the rules, shall be subject to revision by mutual agreement.

6. All quantities and readings of gauges to be telegraphed in accordance with these rules shall be expressed in words.

II. LIMIT GAUGES AND DISCHARGES AT THE UPPER ANICUT.

7. The minimum flow of the Cauvery that must be ensured at the Upper

Anicut before any impounding is made in the Krishnarajasagara, as connoted by the readings of the Cauvery Dam north gauge, shall be as follows:—

Month.	Readings of the Cauvery Dam North gauge.
June	Six and a half feet.
July and August	Seven and a half feet.
September	Seven feet.
October	Six and a half feet.
November	Six feet.
December	Three and a half feet.
January	Three feet.

8. The discharges connoted by the gauge readings set forth in rule 7 shall, in the case of regulation during the irrigation season (*vide* rule 9) of 1921, be deduced from the average discharge curve derived from the joint gaugings of the Cauvery at the Cauvery Dam made in the four years ending 1920. The said discharges shall be revised, if necessary, after completion of the joint gaugings of 1921 and shall be used for the purpose of regulation for the five years ending 1926. The said discharges shall be finally revised and adopted for all subsequent regulation, at the conclusion of the joint gauging of the year 1926, on the basis of the joint gaugings of the ten years ending 1926.

9. The south-west monsoon shall, for the purpose of these rules, be considered to extend from the 1st June to the 30th September, both days inclusive, and the north-east monsoon from the 1st October to the 31st January, both days inclusive. The irrigation season shall be taken to extend from the 1st June to the 31st January, both days inclusive. All dates in this rule shall have reference to the Upper Anicut.

III. Impounding Formula.

10. Impounding in the Krishnarajasagara during the irrigation season shall be regulated in accordance with following formula:—

$$I = \frac{Kn}{P} - C, \text{ where}$$

I = Quantity that may be impounded,

Kn = Inflow at Krishnarajasagara, that is, the measured flow at the three 'standard' gauging stations at Chunchinkatte on the Cauvery, Akkihebbal on the Hemavati, and Unduvadi on the Lakshmanathirtha, to which shall be added allowances for —

(i) The yield from the catchment between the 'standard' gauging stations and the Krishnarajasagara calculated in accordance with paragraphs 61 and 62 of Colonel Ellis's Manual of Irrigation (1920 Edition) less the quantity of water required for tank irrigation in the tract in question. In the catchment, the discharges of the major streams shall be deduced, if feasible, from gauge readings by mutual agreement. The duty of water for the areas irrigated under tanks shall be taken as 40.

(ii) The drainage from the ayacuts of channels which drain back into the rivers below the 'standard' gauging stations, the quantity in cusecs of such drainage for a particular channel being taken to be 3/16 of the area irrigated in acres divided by 40.

C = Flow connoted by the gauge reading for the particular month concerned given in rule 7 above. The month at Krishnarajasagara corresponding to that at the Upper Anicut is to be taken as commencing and ending four days earlier than at the Upper Anicut.

P = The proportion which the natural flow in the Cauvery at the Krishnarajasagara bears to the corresponding natural flow at the Upper Anicut.

I, Kn and C to be expressed in the same units.

11. (i) Until the 31st January 1927 the values of 'P' in the formula in rule 10 shall be taken as ·625 during the south-west monsoon and ·300 during the north-east monsoon.

(ii) An examination of the effect of impounding in the Krishnarajasagara on the supplies realised at the Upper Anicut shall be made in the form and in accordance with the instructions given in Part II of the Appendix to these rules for each of the ten years ending with the irrigation season of 1926-27 to see whether the tentative factors of ·625 and ·300, provided in part (i) of this rule should be permanently adopted or whether they should be increased (*vide* instructions 25 and 26 of Part II of the Appendix). For the five irrigation seasons ending 1921-22 the average discharge curve for the Cauvery Dam north gauge, obtained from the gaugings of the five-year period ending and including 1921, shall be prepared and adopted for the examination. For subsequent years the discharge curve of the year concerned shall be used. For the months for which it is found necessary, from the examination referred to above, to increase the values of 'P' such values shall be finally adopted and brought into use in lieu of those in part (i) of this rule at the beginning of the irrigation season 1927-28. For months when no increase in the value of 'P' is found to be necessary, the values given in part (i) of this rule shall be finally retained and brought into use at the beginning of the same irrigation season.

12. (i) The whole flow of the river at Krishnarajasagara may be impounded in the reservoir from the 28th January to the 27th of May, both days inclusive, but issues from the reservoir shall be made when necessary to maintain such a flow as will pass to Madras not less than 900 cusecs below Sivasamudram anicut.

(ii) Until the dam is completed to a height admitting of F.R.L. 98 feet above sill level of the existing low level sluices in the dam or until the 28th May 1931, whichever date is the earlier, as an alternative to part (i) of this rule impounding from the 28th January to the 24th February, both days inclusive, shall be in accordance with rules 7, 10 and 11 as far as they relate to the month of January, measurement being made at the Krishnarajasagara; and from the 25th February to the 27th May, both days inclusive, the whole flow at the Krishnarajasagara may be impounded, subject to a flow of 750 cusecs being maintained below Sivasamudram anicut. The Mysore Durbar may at any time before the year 1931 elect to regulate their reservoir as provided in part (i) of this rule, subject to notice being given to the Government of Madras before the 31st December of the year preceding that in which the rule will come into operation. In the event of the Mysore Durbar electing to regulate in accordance with part (i) of this rule no change shall be made thereafter.

IV. Gauge Readings and Inflow Computations.

13. (i) The standard gauges at the gauging stations on the three rivers above the Krishnarajasagara and the gauging station below the same shall be read three times daily, that is, 6 A.M., noon and 6 P.M.

(ii) All gauge readings shall be telephoned immediately after reading to the Controlling officer at the Krishnarajasagara.

14. (i) The computation of the inflow into the Krishnarajasagara shall be made by the said Controlling officer from the electric water level records of the three rivers above the Krishnarajasagara with due allowance for the yield from the intermediate catchment, such allowances being made as provided in rule 10. In the event of an electric recorder differing from the telephoned gauge readings, the latter shall be adopted for computing the inflow for the time being.

(ii) Until the 27th May 1923 the discharges at the standard gauging stations shall be computed from the average curves based on the discharge observations of the four years 1915-1918. For the irrigation seasons 1923-24 to 1927-28, inclusive, the discharges at the standard gauging stations shall be computed on the previous season's curves. For irrigation seasons subsequent to that of 1927-28 the discharges at the standard gauging stations shall be computed on the latest annual curves available.

(iii) In the event of an electric recorder differing from the telephoned gauge readings, the Controlling officer shall, as soon as possible, proceed to the gauging station, check and, if possible, rectify the electric recorder. If the mechanical record is found to differ from the teleponed gauge readings and the mechnical recorder is registering accurately, a correction shall be made in the tentative inflow recorded in the regulation register in accordance with the mechanical record.

(iv) In the event of both recorders breaking down, the telephoned gauge readings shall be the basis of computation.

V. Allowance for Extension of Irrigation in Mysore after the Year 1910.

15. The area to which Mysore is entitled to extend irrigation, without passing compensation water to Madras, by improvement of duty in canals or channels, in existence prior to the year 1910, taking off from the following rivers in Mysore :—

(i) the Hemavathi,

(ii) the Lakshmanathirtha,

(iii) the Cauvery (above and below the reservoir) shall be limited to 1/3 of the existing area prior to the year 1910, the extension under each channel being considered separately.

16. In lieu of 9,274 acres of old irrigation to be submerged by the Krishnarajasagara with F.R.L. at 118 feet above bed of river or 106 feet above the sill of the low level sluices now in existence, Mysore shall be entitled to extend irrigation to an area of 12,500 acres, without passing compensation water to Madras, under canals or channels taking off from the Hemavathi, the Lakshmanathirtha or the Cauvery, constructed subsequent to the year 1910 and above the Krishnarajasagara. In the event of the Krishnarajasagara being constructed of such a capacity as to submerge less than 9,274 acres, the permissible extension shall be reduced according to the area actually submerged and in the ratio of 12,500 to 9,274 and when a larger area is submerged owing to the capacity of the reservoir being increased to 44,827 millions cubic feet (F.R.L. 124 feet above bed of river or 112 feet above the sill of the low level sluices now in existence) the permissible extension shall be similarly increased in the same proportion on such larger area as may be actually submerged.

17. The quantity of water in cusecs due to Madras as compensation for water utilised by Mysore for the area in excess of that provided in rules 15 and 16 shall be calculated by dividing such excess area irrigated by 40.

VI. Computation of Issues.

18. The quantity of water to be passed to Madras shall be computed every 12 hours from the records of inflow of the previous 12 hours.

19. (i) For the purpose of orders for the regulation of the sluice shutters, the quantities of water to be passed through the sluices shall be computed by the application of the formula :—

$D = C. A. \sqrt{2gh.}$

D = Discharge in cusecs.

C = Co-efficient.

A = Height of shutter raised, multiplied by width of vent, both in feet.

g = 32.

h = Effective head in feet.

Joint observations shall be made annually to determine the value of C until values covering the whole range of water level in the Krishnarajasagara have been determined by mutual agreement.

(ii) A suitable formula arrived at by mutual agreement for the discharge over the waste weir shall also be applied when details are known.

20. The quantity of water actually passed down shall be verified by observation between the Krishnarajasagara and the Chickdevaroysagar anicut. The means of such verification shall be decided on by mutual agreement.

VII. Hot Weather Computation of Issues from the Krishnarajasagara.

21. From the 28th January to the 27th May, both days inclusive, when rule 12 (i) is in operation, or from the 25th February to the 27th May, both days inclusive, when rule 12 (ii) is in operation, the Controlling officer shall receive

information from Sivasamudram at least twice daily of the flow during the previous 12 hours at Sivasamudram anicut and shall by occasional visits verify the same.

22. The quantity to be issued from the Krishnarajasagara shall be such quantity as will ensure the passing at Sivasamudram anicut of the quantity provided for in rule 12.

VIII. Regulation Register.

23. All regulation calculations and computations provided in any of the previous rules shall be recorded in a register called the 'Regulation register' and the orders for regulation which result from the computation shall also be recorded under the signature of the Controlling officer.

IX. Regulation.

24. Regulation of sluices shall be made at twelve-hourly intervals, the times of commencement and completion of regulation being entered in the 'Regulation register.'

25. The Controlling officer shall satisfy himself personally when the sluices are finally adjusted that the regulation has been accurately carried out in accordance with recorded orders and certify that he has done so in the 'Regulation register.' Under extraordinary circumstances only shall the sluices be manipulated other than at 12-hour intervals and in such cases full information regarding the reasons and necessity for this and the nature of the intermediate regulation shall at once be communicated by the Controlling officer to each Government.

26. (i) Any deficit or excess in quantity due to Madras indicated by the verification provided in rule 20 or by the water level in the reservoir shall be adjusted in the next period of regulation.

(ii) A computed issue from the Reservoir in excess of that computed as due to Madras may be recouped by Mysore by subsequent regulation; if however the overissue was intentional, such recoupment shall be limited to 20 per cent of the computed issue due to Madras when the overissue was made; if the computed correct water level of the reservoir has been higher than the actual water level for each of the previous eight 12 hourly periods the actual water level, if below the computed correct water level, shall be taken as the correct water level whether the overissue was unintentional or intentional. The computed correct water level of the reservoir shall take account of actual issues for irrigation and losses due to evaporation.

(iii) The rates of evaporation shall be taken as given below until the end of the irrigation season 1924-25.

Month	Inches per month
June	5
July to February	4
March	5
April	7
May	8

After 1924-25 the rates for evaporation shall be determined as provided in instruction No. 7 of Part I of Appendix to these rules. These rates may be revised for final adoption in 1927 by mutual agreement.

(iv) In computing the issue to be passed to Madras through the undersluices or over the weir a deduction shall be made from the computed issue due to Madras of an amount equivalent to $\frac{1}{8}$ of the issues to the two existing low level irrigation channels taking off from the reservoir subject to a maximum deduction of 25 cusecs. No deduction shall be made from the computed issue due to Madras for water issued from the reservoir for irrigation other than that for the channels specified above.

(v) If the information provided for in rule 21 shows that the quantity of water due to Madras under rule 12 is deficient, the regulation shall at once be

altered to ensure the passing at Sivasamudram anicut of the quantity by which the flow has been deficient in the previous 12 hours plus the 900 or 750 cusecs, as the case may be, provided for in rule 12, and each special regulation shall be entered in the 'Regulation register' referred to in rule 23.

X. Discharge at Cauvery Dam during the period ending 31st January 1927.

27. The exact formula for determining the discharge through the Upper Anicut shall be as specified in instruction 18 of the Appendix to these rules.

28. All regulation operations at the Upper Anicut and all data for calculating the discharge through the Upper Anicut sluices and also all gauge readings at the Cauvery Dam shall be recorded daily in a register under the signature of a responsible officer.

XI. Inspection of Records by either Government.

29. The Controlling officer at the Krishnarajasagara shall afford every facility for inspection of his registers, books, calculations, records of regulation and actual method of regulation and gauge readings and discharge measurements and for testing of instruments in his charge to any officer of the Madras Government appointed and authorised by that Government to make such inspection or tests on their behalf. The said Controlling officer and duly accredited inspecting officer shall have full use of telephones, telegraphs or other means of communication installed in connexion with the works.

30. The responsible officer at the Upper Anicut referred to in rule 29 shall afford the same facilities for inspection and testing up to the end of the irrigation season of 1926-27 as those provided for in rule 29, to any officer of the Mysore Government appointed and authorised by that Government to make such inspection or tests on their behalf.

XII. Miscellaneous.

31. The Controlling officer at Krishnarajasagara shall make the following returns to each Government:—

(*a*) By post mail daily a copy of the entries made each day in the 'Regulation register' referred to in rules 23 to 26.

(*b*) By telegram daily or at such intervals as may be agreed on the quantity of inflow into and issue from the Krishnarajasagara during the previous 24 hours or during such intervals as may be agreed upon.

32. From the 1st June to the 31st January, both days inclusive, up to the 31st January 1927 a copy of the entries made each day in the register referred to in rule 28 shall be furnished to the Controlling officer at the Krishnarajasagara by the Superintendent in charge of the Upper Anicut.

33. Photo copies of all diagrams of the self-recording instrument maintained by each Government shall be forwarded to the other Government monthly.

Such diagrams shall not be required from the Madras Government after the 31st January 1927.

A. H. MORIN, Colonel,
Chief Engineer for Irrigation, Madras.

26th July 1921.

S. CADAMBI,
Chief Engineer, Mysore P.W.D.

26th July 1921.

APPENDIX TO THE RULES OF REGULATION.

INSTRUCTIONS FOR THE PREPARATION OF WORKING TABLES OF (i) IMPOUNDING IN THE KRISHNARAJASAGARA AND (ii) AGANDA CAUVERY DISCHARGES FOR MAKING THE EXAMINATION REFERRED TO IN RULE 11 (ii) OF THE RULES OF REGULATION.

The period covered by the working tables and the examination of the effect of the Krishnarajasagara on supplies due to Madras at the Upper Anicut shall be from the 1st June 1917 to the 31st January 1927. Of these, the Krishnarajasagara working tables will be made in sample form A for each year during the ten-year period; and the Cauvery Dam discharge tables will be made in sample form B for only such periods when there is any impounding in the Krishnarajasagara as shown in sample form A.

PART I.

KRISHNARAJASAGARA WORKING TABLES.

(Vide sample Form A.)

The full effective capacity of the reservoir is to be taken as that connoted by the full reservoir level at 112 feet above sill level of the existing undersluices (124 feet above bed of the river before the construction of the dam), namely 44,827 millions cubic feet. The actual balance as obtained from the previous year's working tables or 5,000 millions cubic feet, whichever is the greater, should be taken as the starting balance on the 28th May of each year.

The balance on the 28th May 1917 should be that obtained from working tables of the year 1916 or 5,000 millions cubic feet, whichever is the greater, and the opening balance on the 28th May 1916 should be taken as 5,000 millions cubic feet.

2. *Column (1).*—The twelve-hourly period to be that ending 6 A.M. or 6 P.M.

3. *Column (2).*—The flow into the reservoir to be the measured flow at the three 'standard' gauging stations plus an allowance for the yield from the intermediate catchment; that is, 'Kn' in rule 10 of the Rules of Regulation computed from the readings provided in rule 13 (i) of the Rules of Regulation. From June 1916 to June 1922 the curves of discharge for the standard gauging stations above the reservoir shall be the average curves based on the discharge observations of the four years 1915 to 1918. From 1922 to 1926, both years inclusive, gaugings shall be made at the three standard gauging stations and the annual discharge curves obtained shall be used for the years concerned.

4. *Column (3).*—Regulation to be assumed to have been made in accordance with the Rules of Regulation for the whole period of eleven years and the quantity that may be impounded so derived to be entered in this column for each twelve-hourly period, the working tables in this form for 1916 being intended only for arriving at the starting balance in the reservoir on 28th May 1917.

The value of C in the impounding formula to be obtained from the curve used for arriving at the discharges at the Upper Anicut for the respective years—*vide* rule 11 (ii).

5. *Columns (4) and (5).*—The average draw-off in millions cubic feet for each twelve hourly period for irrigation to be taken as follows for entry in columns (4) and (5).

Month.	Monsoon crop.	Perennial crop.
June, first-half	....	27
„ second-half	51·5	27
July to November....	51·5	27
December	34·5	27
January, first-half	25·7	27
„ second half	....	27
February to end of May	....	27

6. *Column (6).*—The issues for power to be those actually recorded but subject to a minimum of 900 cusecs measured at Sivasamudram during the period 28th January to 27th May, both days inclusive, and entered in this column.

Karnataka State Archives,
(Departmental Library)
ಕರ್ನಾಟಕ ರಾಜ್ಯ ಪತ್ರಾ
(ಇಲಾಖಾ ಗ್ರಂಥಾ
ಸ್ವಾಧೀನ Accession
Date

7. *Column (7).*—The allowances for evaporation to be determined for each month by mutual agreement after making joint observations during the three irrigation seasons ending and including 1924-25, quantities being deduced on the opening balance of the reservoir every day at 6 AM. and 6 P.M.

8. *Column (8).*—Instruction in heading to be followed.

9. *Column (9).*—Instruction in heading to be followed.

10. *Column (10).*—Balance of previous twelve-hourly period plus column (9) or 44,827 millions cubic feet, whichever is less, to be entered in this column.

11. *Column (11).*—Any excess of the algebraic sum of the quantity in column (9) and that for the previous twelve-hourly period in column (10) over 44,827 millions cubic feet, to be entered in this column.

12. *Column (12).*—Instruction in the heading to be followed.

A. H. MORIN, COLONEL,
Chief Engineer for Irrigation, Madras.

26th July 1921.

S. CADAMBI,
Chief Engineer, Mysore P.W.D.

26th July 1921.

SAMPLE FORM A.

Quantity of the natural flow of the Cauvery impounded in the Krishnarajasagara.

(All quantities in millions cubic feet.)

Twelve-hourly period ending		Flow into the Krishnarajasagara	Quantity that may be impounded	Draw off				Total draw off (columns 4 + 5 + 6 + 7)	Net quantity that may be impounded (column 3—column 8).	Balance in reservoir	Surplus from reservoir	Quantity impounded in the Krishnarajasagara (column 3 — column 11).	Remarks
Date	Hour			Monsoon crop	Perennial crop	Power	Evaporation						
(1-*a*)	(1-*b*)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

PART II.

AGANDA CAUVERY DISCHARGE TABLES.

(*Vide* sample Form B.)

13. The examination of the effect of impounding in the Krishnarajasagara to be made in sample form B. Entries will only be made in this table for actual impounding periods of six consecutive twelve-hourly periods and over as exhibited in sample form A.

14. *Column (1).*—The number to refer to the whole impounding period.

15. *Column (2).*—The entry in this column to refer only to dates of an impounding period shown in sample form A and not to date in column (3). For the purpose of this examination the impounding period will be taken to include any interval up to and including six twelve-hourly periods between actual impounding period and the succeeding actual impounding period as defined in instruction 13 above.

16. *Column (3).*—The date and hour of the first entry of an impounding period made in this column to be those 24 hours prior to the end of the first twelve-hourly period of impounding shown in sample form A. The date and hour of the last entry

Karnataka State Archives,
(Departmental Library)

of an impounding period to be those 48 hours after the last twelve-hourly period of impounding shown in sample form A, as determined by instruction 15 above.

17. *Column (4).*—The time for transmission from the Krishnarajasagara to the Upper Anicut shall be taken as the average indicated by a comparison of such peak gauge readings of the Chickdevaroysagar and Upper Anicuts as are available up to the end of 1921, fractions of a twelve-hourly period less than six hours in the average result being neglected and those greater than six hours being taken as one twelve-hourly period. Only peak gauges from half a foot below the limits in rule 7 of the Rules of Regulation up to 9 feet in the south-west monsoon and 7½ feet in the north-east monsoon to be taken into account. Separate averages to be deduced for the south-west and north-east monsoons.

18. *Column (5).*—The total discharge in the Aganda Cauvery (*a*) and (*b*) below to be calculated from the records of the automatic water level recorder, if the readings of the gauge made at 6 A.M., noon and 6 P.M. show the recorder to have registered accurately, otherwise the readings of the gauges made at 6 A.M., noon and 6 P.M. to be used and the discharges averaged for each twelve-hourly period.

(*a*) The discharge of the Cauvery shall be that given by the discharge curves for the Cauvery Dam gauge provided in rule 11 (ii) of the Rules of Regulation.

(*b*) The discharge through the Upper Anicut regulators to be calculated as laid down in paragraph 13 of Part II of Volume III of 'Papers regarding the Cauvery Reservoir Project' (pages 7 and 8) account being taken of any intermediate regulation.

19. *Column (6)* (*a*).—The quantity to be entered in this column is that due to the actual rise in the reservoir, as shown from the Regulation records, plus the loss due to evaporation, plus the recorded issue for irrigation after making the deduction provided for in rule 26 (iv) of the Rules of Regulation.

Column (6) (*b*).—The quantity to be entered in this column is that due to the actual fall in the reservoir, as shown from the Regulation records, minus the loss due to evaporation, minus the recorded issue for irrigation after adding the deduction provided for in rule 26 (iv) of the Rules of Regulation.

20. *Column (7).*—A percentage allowance, if decided to be necessary, to be made for loss in transmission between the Krishnarajasagara and the Upper Anicut. This allowance to be settled by mutual agreement in June 1926 after further examination of the subject and any joint observations made to determine it; in the event of disagreement the case to be referred to the Government of India for final decision. Figures corresponding to column (6) (*a*) will be a plus entry in this column and those corresponding to column (6) (*b*) a minus entry.

21. *Column (8).*—Instruction in heading to be followed.

22. *Column (9).*—The quantity due to Madras in any twelve-hourly period to be the whole natural flow of the Aganda Cauvery or the discharge connoted by the gauge-readings in rule 7 of the Rules of Regulation obtained from the discharge curves referred to in rule 11 (ii) of the Rules of Regulation, whichever is less.

23. *Columns (10), (12),(13)* and *(14.)*—Instructions in headings to be followed.

24. *Column (11).*—See instruction 20 above.

25. The several periods in column (1) should be sorted out against the several months showing against each month the percentage of deficit obtained in column (14). If the actual impounding period extends over portions of two months as noted in column (2), then the resulting percentage in column (14) to be counted against both the months.

26. After thus sorting out the periods for all the ten years against the several months, the resulting deficit in excess of 5 per cent is to be neglected if it happens in only one period of examination relating to a particular month. If it happens in more than one period the proportion factor is to be increased so as to reduce the number of such deficit periods to one only in any month.

A. H. MORIN, COLONEL,
Chief Engineer for Irrigation, Madras.
26th July 1921.

S. CADAMBI,
Chief Engineer, Mysore P.W.D.
26th July 1921.

LIBRARY, KARNATAKA STATE ARCHIVES, BANGALORE

SAMPLE FORM B.

(All quantities in millions cubic feet.)

(1) Serial number.	(2) Month or months affected by impounding in the Krishnarajasagara.			Natural flow in the Aganda Cauvery							Flow in the Aganda Cauvery after impounding in the Krishnarajasagara for the whole impounding period.		Effect of impounding in the Krishnarajasagara with tentative values of "P" on the natural flow of the Aganda Cauvery due to Madras under the terms of settlement.	
		Twelve-hourly period ending.		Twelve-hourly period affected by impounding after allowing for time in transmission from the Krishnarajasagara.		Actual discharge of the Aganda Cauvery for the twelve-hourly period in column (4).	Increase in storage in the Krishnarajasagara as given by actual levels+actual loss by evaporation+actual draw off for irrigation—1/8 of actual draw-off for irrigation limited to 25 cusecs.	Decrease in storage in the Krishnarajasagara as given by actual levels—actual loss by evaporation—actual draw off for irrigation+1/8 of actual draw off for irrigation limited to 25 cusecs.	Equivalent of quantity in column 6(*a*) or 6(*b*) at the Upper Anicut after allowing for loss in transmission with+or—as the case may be.	Natural flow in the Aganda Cauvery for the twelve-hourly period in column 4 [the algebraic sum of columns (5) and (7)].	Quantity of natural flow in column (8) due to Madras, either limit flow or the quantity in column (8) whichever is less.			
		(3-*a*) Date.	(3-*b*) Hour.	(4-*a*) Date.	(4-*b*) Ending hour.							Quantity impounded in the Krishnarajasagara for the whole period given in column (3) corresponding to the number in column (1). [From column (12) of sample form A].	Equivalent of quantity in column (10) at the Upper Anicut after allowing for loss in transmission.	Resulting flow in the Aganda Cauvery after impounding for the whole period given in column (4) corresponding to the number in column (1) [Total column (8)—column (11)].	Deficiency of resulting flow in column (12) on total quantity in column (9). [Total column (9)—column (12)].
												(10)	(11)	(12)	(13)
															Percentage of deficiency in column (13) on total quantity in Col. (9) $\frac{\text{Col. (13)}}{\text{Total Col. (9)}} \times 100$. (14)

P. HAWKINS,
Secretary to Government,
Public Works Department, Madras.

18th February 1924.

A. R. BANERJI,
Dewan of Mysore.

18th February 1924.

ANNEXURE II.

The construction of a masonry dam and reservoir on the Cauvery river,—now known as the Krishnarajasagara,—at Kannambadi, 8 miles west of Seringapatam north latitude 12° 33′ 20″ and east longitude 76° 37′ 15″; such dam and reservoir to be of a storage capacity, not higher than 112 feet above the sill of the under-sluices constructed in the body of the dam across the old river-bed portion, corresponding to 124 feet above the bed of the river before the construction of the dam; such reservoir to be of an effective capacity of 44,827 m. c.ft., measured from the sill of the irrigation sluices constructed at 60 feet level above the bed of the river up to the maximum height of 124 feet above the said bed of the river. (Note that the level of the bed of the river before the construction of the dam is taken as 12 feet below the sill level of the said under-sluices.) Subject to the above specified modifications in regard to the maximum height of water stored, and the effective capacity, such dam and reservoir to be constructed in accordance with the design accompanying the Project Report furnished with the Dewan of Mysore's demi-official letter No. 2311, dated 16th May 1911.

P. HAWKINS,
Secretary to Government,
Public Works Department, Madras.

18th February 1924.

A. R. BANERJI,
Dewan of Mysore.

18th February 1924.

ANNEXURE III.

Points agreed to at the Conference between the Chief Engineers of the Madras and Mysore Governments regarding the Cauvery dispute.

The technical agreement of the Krishnarajasagara, come to in 1921 between the Chief Engineers of the two Governments, will be taken as finally settled subject to the alterations in rules 15 and 17 now agreed to as shown in Appendix I, and the Krishnarajasagara question also settled according to that agreement.

2. The extent of future extension of irrigation in Mysore under the Cauvery and its tributaries mentioned in Schedule A of the 1892 Agreement shall be fixed at 110,000 acres, and Madras shall have their Cauvery-Metur Project as revised in 1921 with their new area of irrigation fixed at 301,000 acres, as specified in paragraph 11, page 4 of the Project Report (1921), Volume V.

3. Such extensions of future irrigation in Mysore will be carried out only by means of reservoirs on the Cauvery and its tributaries mentioned in Schedule A of the 1892 Agreement. Such reservoirs may be of an effective capacity of 45,000 millions cubic feet in the aggregate; and the impounding therein shall be so adjusted as not to make any material diminution of the supplies connoted by the gauges accepted in the technical agreement for the Krishnarajasagara, it being understood that the rules for the working of such reservoirs shall be so framed as to reduce to within 5 per cent, any loss during any impounding period in excess of 5 per cent by the adoption of suitable proportion factors, impounding formula, or other means that may be settled at the time.

4. Full particulars and details of such reservoir schemes shall be furnished to the Madras Government to enable them to satisfy themselves that the conditions in paragraph 3 above will be fulfilled. If there arise any difference of opinion between the Madras and Mysore Governments regarding any scheme sent by the Mysore Government, the matter shall be settled in accordance with clause IV of the 1892 Agreement.

5. The reserve storage for power generation purposes now allowed in the Krishnarajasagara may be utilized from any other reservoir, according to the convenience of Mysore; and the storage released from the Krishnarajasagara may be utilized for irrigation within the extent of 110,000 acres noted above. In that case, the working tables of the new reservoir from which power water will be utilized, will be framed after taking into consideration the conditions specified in paragraph 3 above and the altered conditions of irrigation under the Krishnarajasagara.

6. It is suggested that the present limitation in regard to the extension of new irrigation as in paragraph 2 above shall hold good for a period of 50 years; at the end of that period it may be subject to reconsideration.

A. V. RAMALINGA AYYAR,
Chief Engineer for Irrigation, Madras.

14th September 1923.

S. CADAMBI,
Special Officer, Krishnarajasagara Works.

14th September 1923.

APPENDIX I.

Alterations in rules 15 and 17 of the Technical Agreement of 1921.

Rule 15.—After the words 'the year 1910' at the end of the rule, *add* the words 'the extension under each channel being considered separately.'

Rule 17.—In line 1 after the words 'The quantity of water,' *add* the words 'in cusecs.'

P. HAWKINS,
Secretary to Government,
Public Works Department, Madras.

18th February 1924.

A. R. BANERJI,
Dewan of Mysore.

18th February 1924.

G.R.S. IX—5]

Previous references. 192 . **File No.**

( ) **Serial Nos.**

Later references.

GENERAL AND REVENUE SECRETARIAT.

Serial Nos.

Part B for

SUBJECT

Printed on the Multigraph.